CHELSEA®

Bulletin HY25-1650-M1/US

Owner's Manual Electronic Overspeed Control

Effective: April 2010
Supercedes: HY25-1650-M1/US
December 2009

Parker

⚠ WARNING — User Responsibility

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the “Offer of Sale”.

Patent Information

The Chelsea® Power Take-Off or its components shipped with this owner's manual may be manufactured under one or more of the following U.S. patents:
4610175 5228365 4597301 5645363 6151975 6142274 6260682 7159701 B2 7510064 US7690450 B2
Other patents pending.

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Parker Hannifin Corporation
Chelsea Products Division
Olive Branch, MS 38654 USA

General Safety Information

Safety Information....1
Foreword....2

Installation Instructions

The Control....3
Installation P.T.O. Components....4
Wiring the Control Unit....5
Electronic Overspeed (E.O.C.) Installation Sketch for 270, 271,800 and 852 Series (Allison)....6
Electronic Overspeed (E.O.C.) Installation Sketch for 230 and 231 Series 12 and 24 Volt....7
Electronic Overspeed (E.O.C.) Installation Sketch for 885 Series 12 and 24 Volt....8
Electronic Overspeed (E.O.C.) Installation Sketch for 270 Series 12 and 24 Volt....9
Electronic Overspeed (E.O.C.) Installation Sketch for 270 and 271 Series (Allison 1000, 2000/2400)....10
Electronic Overspeed (E.O.C.) Installation Sketch for 230 and 231 Series 12 and 24 Volt (Allison 1000, 2000/2400)....11
Electronic Overspeed (E.O.C.) Installation Sketch for 277, 278 and 859 Series for Allison (SK-472)....12
Electronic Overspeed (E.O.C.) Installation Sketch for 277, 278 and 859 Series for Caterpillar (SK-473)....13
Electronic Overspeed (E.O.C.) Installation Sketch for 247 Series....14
247 Series Wiring Chart....15
Electronic Overspeed (E.O.C.) Installation Sketch for 890 Series....16
Electronic Overspeed (E.O.C.) Installation Sketch for 248 Series....17
248 Series Wiring Chart....18
Control Adjustment Instructions....19-21
Operating Instructions....22-23
Troubleshooting....24
P.T.O. Maintenance....25
Offer of Sale....27

Safety Information

These instructions are for your safety and the safety of the end user. Read them carefully until you understand them.

General Safety Information

WARNING: Before selecting or using this product, it is important that you read and follow the product warnings and instructions in the Owner's Manual.

WARNING: Failure or improper use of the Parker Chelsea Electronic Overspeed Control, Power Take-Offs (P.T.O.s) or related accessories can cause death, personal injury and property damage. Possible consequences of failure or improper use of these products include but are not limited to the following:

- Operators, bystanders or equipment being crushed, impacted or caused to fall due to the sudden, inadvertent, unintended, uncontrolled or unexpected movement, stopping or starting of devices such as lifts, hoists, blowers, augers or pumps which are driven by a P.T.O. This can occur when the P.T.O. is improperly or unexpectedly engaged or disengaged.
- Rotating shaft injuries resulting from skin, hands, clothing, hair or the like getting caught in the rotating shaft connected to a P.T.O. or the rotating portion of the equipment driven by the P.T.O.

WARNING: Always remember to disengage the P.T.O. when the driven equipment is not in operation.

WARNING: When the Parker Chelsea Electronic Overspeed Control is set up in Auto Re-engagement Mode, the P.T.O. will automatically engage when the engine RPM reaches the lower preset point thus causing the driven equipment to become operable. The vehicle or equipment operator must therefore make certain that other persons and property are not in a position to be crushed, impacted, caused to fall or otherwise injured when re-engagement occurs.

WARNING: Original equipment manufacturers incorporating the Parker Chelsea Electronic Overspeed Control into their equipment must undertake a failure mode and effect analysis (FMEA) to identify potential hazards created by the Automatic Re-engagement Mode. They must then incorporate fail safe designs into their equipment to protect operators, other persons and property from injury associated with unexpected disengagement or re-engagement of the P.T.O.

Foreword

What It Is

The Chelsea Electronic Overspeed Control (E.O.C.) is an electronic controller that prevents the Power Take-Off and driven equipment from being operated at excessive speeds. This is done by automatically disengaging the Power Take-Off whenever a pre-set overspeed R.P.M. is exceeded.

How It Works

The Chelsea Electronic Overspeed Control (E.O.C.) energizes the solenoid valve that engages the clutch in the Power Take-Off. The control also measures the speed of the Power Take-Off and electronically compares it to the pre-set overspeed R.P.M. setting. As long as the operating speed is less than the high limit, the Power Take-Off will operate in a normal manner.

If the operating speed exceeds the selected high limit, the control will automatically de-energize the solenoid valve and the Power Take-Off clutch will disengage. The clutch will remain disengaged until the speed has been reduced to the pre-set low limit.

The Control

Under the Dash:

Select a convenient location where the indicator lights will be visible and the ON-OFF button is accessible to the operator. Mark two mounting hole locations, using the control panel mounting bracket as a template.

CAUTION: Do not drill into wires or a vital part on the opposite side of the dashboard – check before drilling.

Then, drill two holes and temporarily mount the control to the dashboard, using the 1/4" screws, lock-washers and nuts provided.

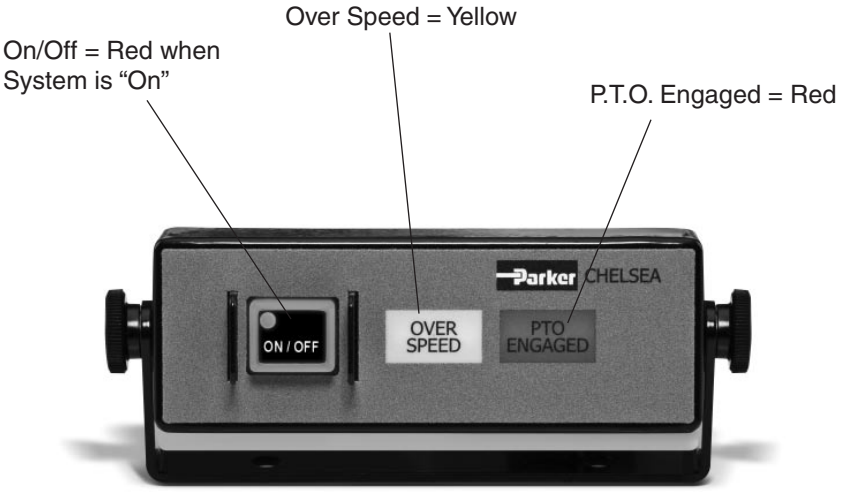
On the Engine Housing:

Tilt cabs may require the control to be mounted on the engine housing, with the mounting bracket and screws provided. Mark two mounting hole locations, using the mounting bracket as a template.

CAUTION: Do not drill into wires or a vital part on the opposite side of the engine housing – check before drilling.

Then drill two holes and temporarily mount the control and mounting bracket to the engine housing.

NOTE: Adjustments will be required at the bottom of the control.
(See Page 21)



The Solenoid Valve

Select a convenient location, near the Power Take-Off to allow the use of shorter hoses, but away from moving parts and the hot exhaust pipe. Mark the mounting hole locations, using the solenoid valve mounting bracket as a template.

CAUTION: Do not drill into wires or a vital part on the opposite side of the mounting surface – check before drilling.

Attach the solenoid valve to the mounting bracket using the screws provided and mount them to the vehicle.

The Pressure Switch

Install the pressure switch, the screen adapter and the three hoses, as shown in the SK drawing for your Power Take-Off.

The Speed Pick-up

In case the speed pick-up was not installed at the factory, remove and discard the plug in the Power Take-Off case over the input gear. Install the speed pick-up and tighten it with a crowsfoot adapter and a torque wrench to approximately 24-lb. ft. torque. Proceed with the electrical hook-up of the control system, as shown in the SK drawing for your Power Take-Off.

Routing the Cables

Tilt Cabs: To permit the cab to tilt, the cables must be routed around the cab pivot point.

Conventional Cabs: Holes in the firewall are usually provided for the speedometer cable or wiring harnesses and the control cables can usually be routed through them.

A Through-Hole: If an existing through-hole cannot be used, drill a 1" diameter hole and install the split rubber grommet provided, after all the wires have been installed.

CAUTION: Do not drill into wires or a vital part on the opposite side – check before drilling.

Wiring the Control Unit

Input Power-the Red Wire: Connect to a source of power that is "switched" or hot only when the key is in the ON position, using the instant connector provided. This unit can be wired to 12V or 24V DC supply (Mininum 5 amp).

Input Ground-the Black Wire: Good ground connections are important . . . directly on the frame is best . . . fiberglass panels won't work at all.

Wiring the Solenoid Valve

Ground-either Red wire: Attach the ring connector provided and make a good ground connection, preferably on the truck frame.

Power-the "other" Red wire: Connect the other red wire to the green wire with the butt connector provided. Route this green wire to the control unit and connect it to the green wire.

Wiring the Pressure Switch

Ground: Using the black wire provided in the kit, push the bullet connector end onto either terminal of the pressure switch. Make a good ground connection with the other end of the black wire, on the truck frame. Using the blue wire provided in the kit, push the bullet connector onto the other terminal of the pressure switch. Route the wire to the control unit and connect it to the blue wire.

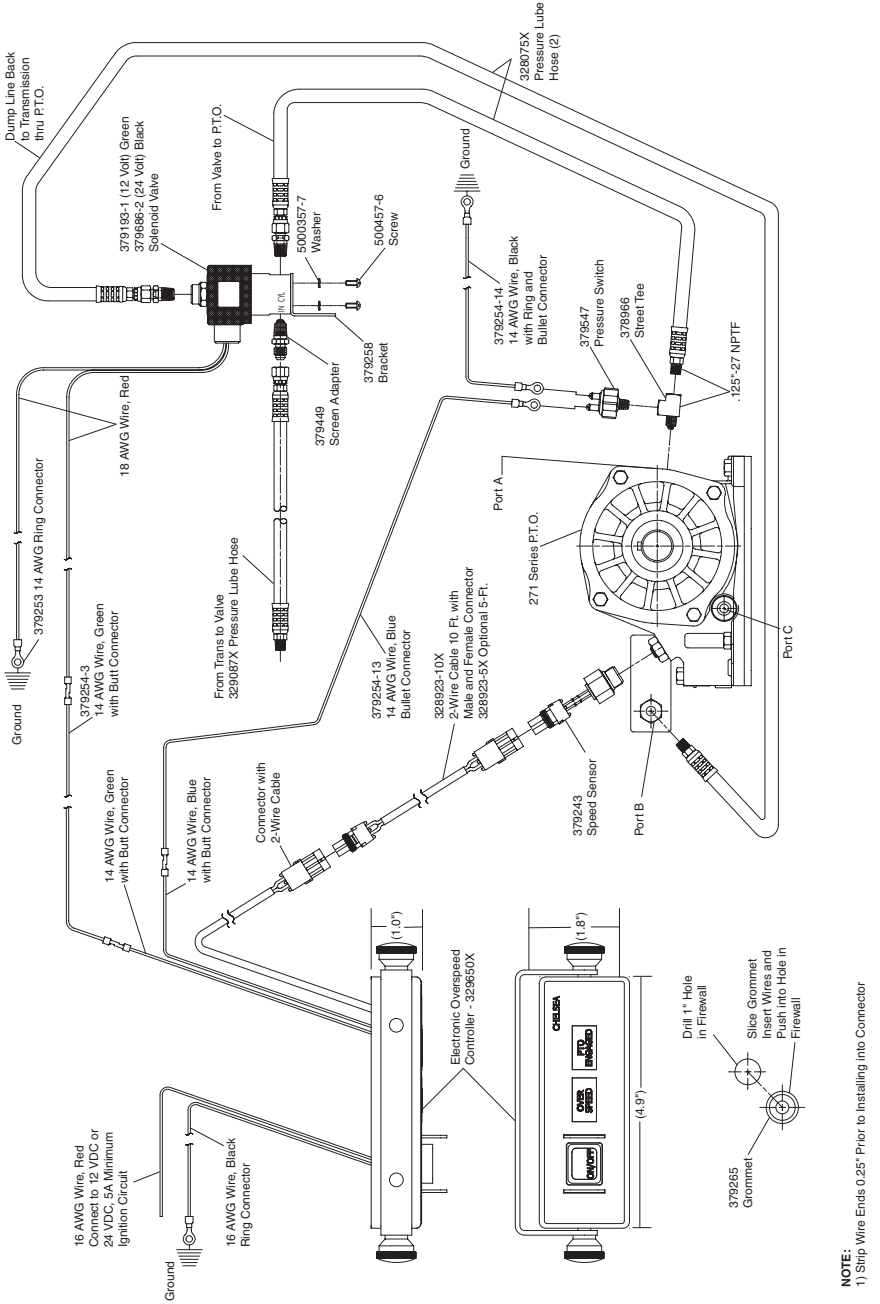
Wiring the Speed Pick-up

Selecting the Cable: A ten foot long cable is provided in the kit, which should be adequate for most installations. Additional five or ten foot long cables are available and can be connected end-to-end if necessary.

Dealing with Cable "Extra" Length: The cables are specially shielded and must not be cut or spliced. Any extra length should be coiled up and tucked away under the dash.

Routing & Protecting the Cables: Bundle together the speed pick-up cable, the pressure switch wire and the solenoid wire. Route the wires away from moving parts, hot pipes, sharp edges and up out of the way.

Electronic Over Speed Control (E.O.C.) Installation Sketch for 270, 271, 800 and 852 Series (Allison) (SK-466)


Dump Line Back to Transmission thru P.T.O.
379193-1 (12 Volt) Green
379686-2 (24 Volt) Black
Solenoid Valve
From Valve to P.T.O.
5000357-7 Washer
500457-6 Screw
379258 Bracket
379449 Screen Adapter
328075X Pressure Lube Hose (2)
Ground
379254-14 14 AWG Wire, Black with Ring and Bullet Connector
379547 Pressure Switch
378966 Street Tee
.125"-27 NPTF
18 AWG Wire, Red
379253 14 AWG Ring Connector
Ground
379254-3 14 AWG Wire, Green with Butt Connector
From Trans to Valve 329087X Pressure Lube Hose
379254-13 14 AWG Wire, Blue Bullet Connector
328923-10X 2-Wire Cable 10 Ft. with Male and Female Connector 328923-5X Optional 5-Ft.
Port A
271 Series P.T.O.
Port C
Port B
379243 Speed Sensor
14 AWG Wire, Green with Butt Connector
14 AWG Wire, Blue with Butt Connector
Connector with 2-Wire Cable
(1.0")
(1.8")
Electronic Overspeed Controller - 329650X
CHELSEA
OVER SPEED
RESET
ON/OFF
(4.9")
Drill 1" Hole in Firewall
Slice Grommet Insert Wires and Push into Hole in Firewall
379265 Grommet
16 AWG Wire, Red Connect to 12 VDC or 24 VDC, 5A Minimum Ignition Circuit
16 AWG Wire, Black Ring Connector
Ground
NOTE:
1) Strip Wire Ends 0.25" Prior to Installing into Connector

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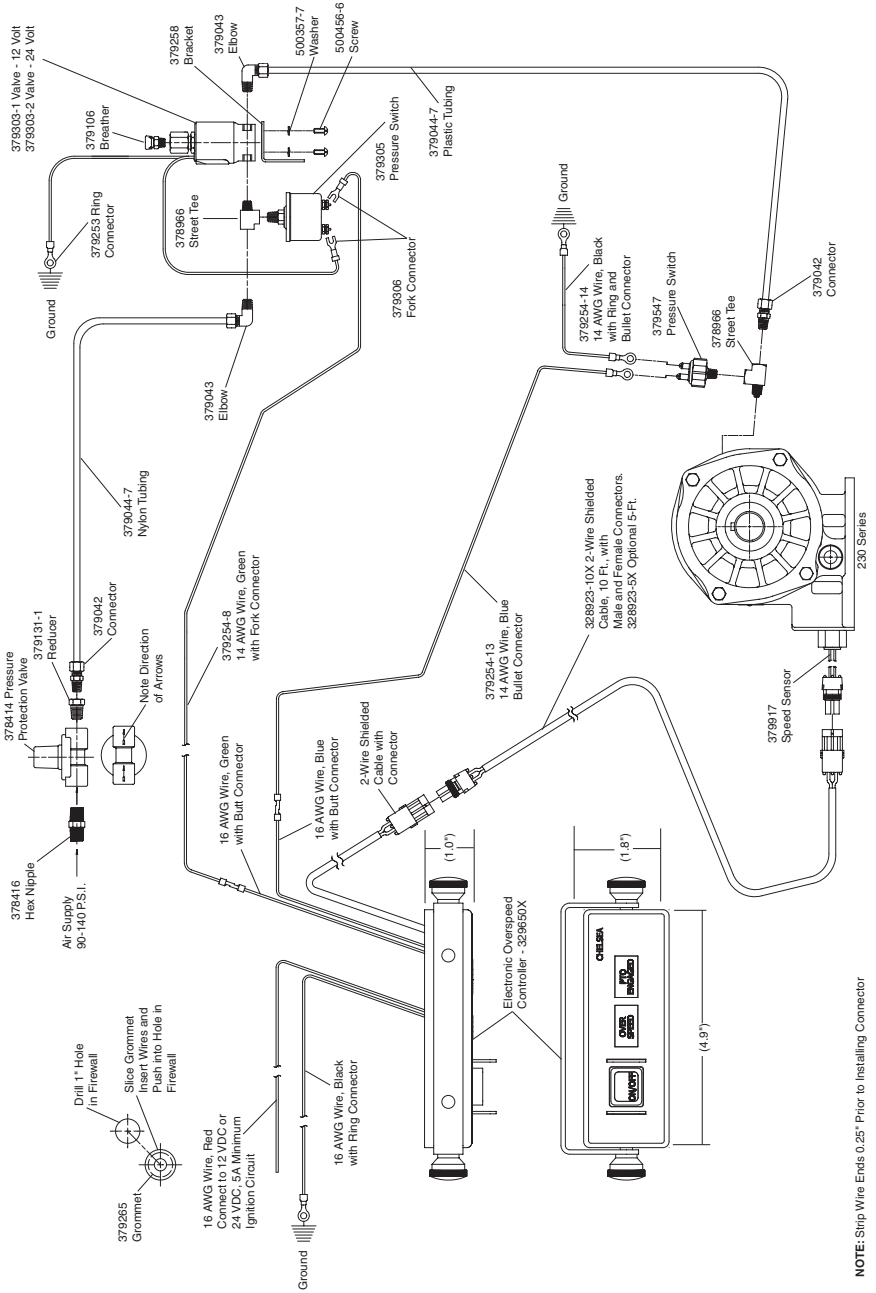
Electronic Over Speed Control (E.O.C.) Installation Sketch for 230 and 231 Series 12 and 24 Volt (SK-467)


379303-1 Valve - 12 Volt
379303-2 Valve - 24 Volt
379258 Bracket
379043 Elbow
500357-7 Washer
500456-6 Screw
379106 Breather
379305 Pressure Switch
379044-7 Plastic Tubing
379253 Ring Connector
378966 Street Tee
379306 Fork Connector
Ground
379043 Elbow
379044-7 Nylon Tubing
379254-14 14 AWG Wire, Black with Ring and Bullet Connector
379547 Pressure Switch
378966 Street Tee
379042 Connector
328923-10X 2-Wire Shielded Cable, 10 Ft., with Male and Female Connectors. 328923-5X Optional 5-Ft.
230 Series
379131-1 Reducer
379042 Connector
Note Direction of Arrows
379254-8 14 AWG Wire, Green with Fork Connector
379254-13 14 AWG Wire, Blue Bullet Connector
378414 Pressure Protection Valve
16 AWG Wire, Green with Butt Connector
16 AWG Wire, Blue with Butt Connector
2-Wire Shielded Cable with Connector
379917 Speed Sensor
(1.0")
(1.8")
(4.9")
378416 Hex Nipple
Air Supply 90-140 P.S.I.
Electronic Overspeed Controller - 329650X
Drill 1" Hole in Firewall
Slice Grommet Insert Wires and Push into Hole in Firewall
379265 Grommet
16 AWG Wire, Red Connect to 12 VDC or 24 VDC, 5A Minimum Ignition Circuit
16 AWG Wire, Black with Ring Connector
Ground
NOTE: Strip Wire Ends 0.25" Prior to Installing Connector

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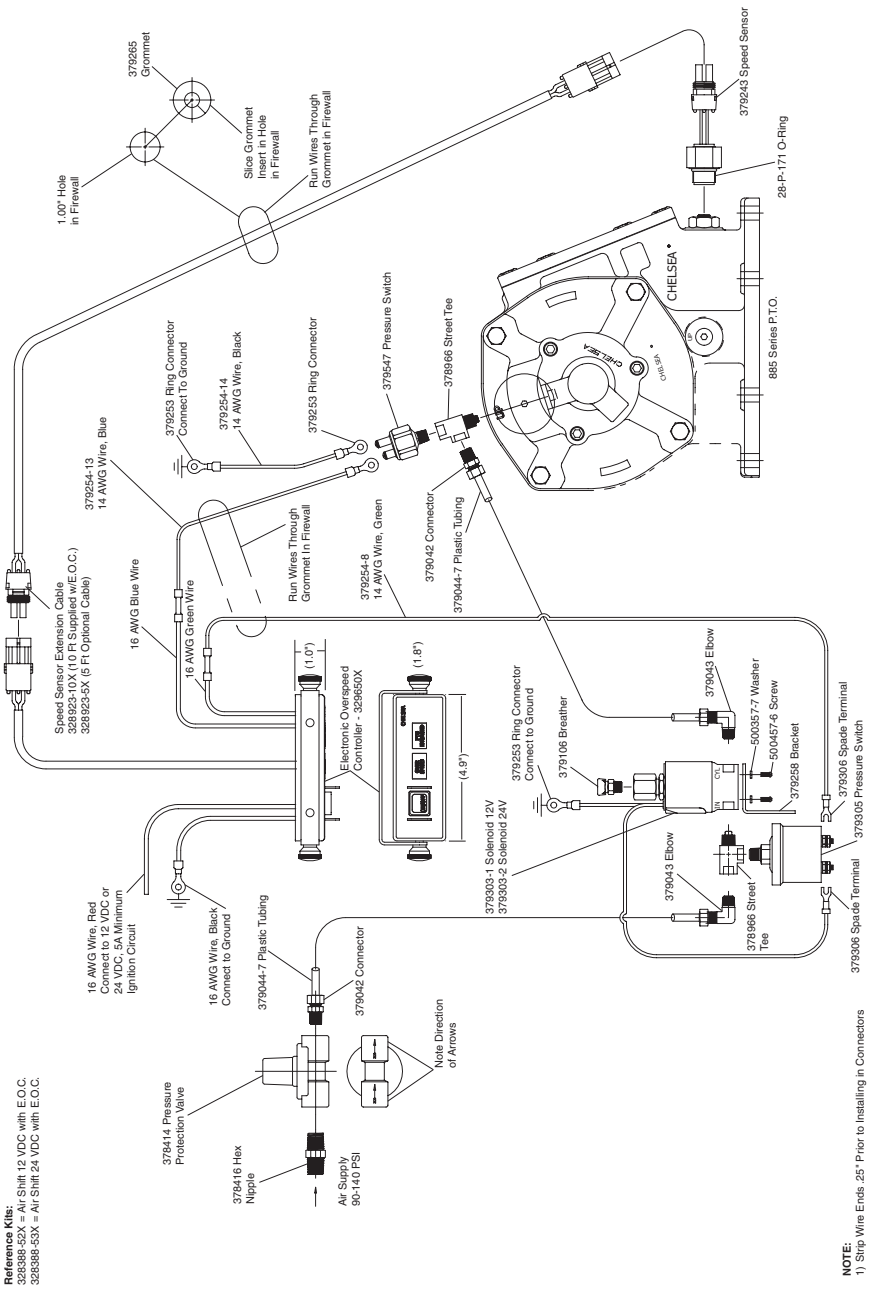
Electronic Over Speed Control (E.O.C.) Installation Sketch for 885 Series 12 and 24 Volt (SK-468)



Reference Kits:
328388-52X = Air Shift 12 VDC with E.O.C.
328388-53X = Air Shift 24 VDC with E.O.C.

NOTE:
1) Strip Wire Ends .25" Prior to Installing in Connectors

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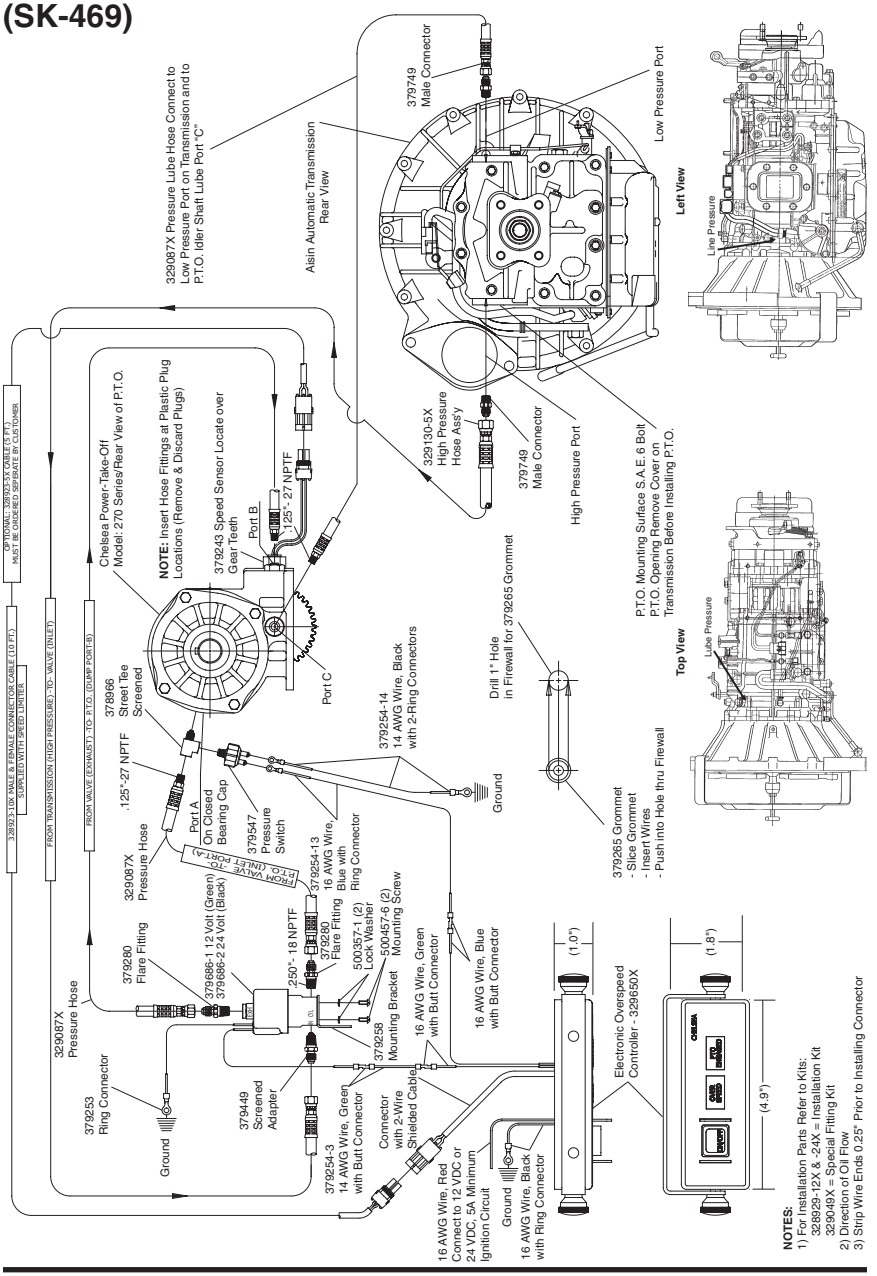
Electronic Over Speed Control (E.O.C.) Installation Sketch for 270 Series 12 and 24 Volt AISIN Automatic Transmission (Models A443, A445 & A450-43LE) (SK-469)


329087X Pressure Lube Hose Connect to Low Pressure Port on Transmission and to P.T.O. Idler Shaft Lube Port "C"
Aisin Automatic Transmission Rear View
379749 Male Connector
Low Pressure Port
Left View
Line Pressure
329130-5X High Pressure Hose Assy
379749 Male Connector
High Pressure Port
P.T.O. Mounting Suface S.A.E. 6 Bolt
P.T.O. Opening Remove Cover on Transmission Before Installing P.T.O.
Top View
Lube Pressure
Chelsea Power-Take-Off Model: 270 Series Rear View of P.T.O.
NOTE: Insert Hose Fittings at Plastic Plug Locations (Remove & Discard Plugs)
379243 Speed Sensor Locate over Gear Teeth
Port B
.125"-27 NPTF
Port C
Drill 1" Hole in Firewall for 379265 Grommet
379265 Grommet
- Slice Grommet
- Insert Wires
- Push into Hole thru Firewall
379254-14 14 AWG Wire, Black with 2-Ring Connectors
Ground
378966 Street Tee Screened
.125"-27 NPTF
Port A On Closed Bearing Cap
379547 Pressure Switch
379254-13 16 AWG Wire, Blue with Ring Connector
329087X Pressure Hose
379280 Flare Fitting
379686-1 12 Volt (Green)
379686-2 24 Volt (Black)
.250"-18 NPTF
379280 Flare Fitting
500357-1 (2) Lock Washer
500457-6 (2) Mounting Screw
379258 Mounting Bracket
16 AWG Wire, Green with Butt Connector
16 AWG Wire, Blue with Butt Connector
329087X Pressure Hose
379253 Ring Connector
Ground
379449 Screened Adapter
Connector with 2-Wire Shielded Cable
379254-3 14 AWG Wire, Green with Butt Connector
16 AWG Wire, Red Connect to 12 VDC or 24 VDC, 5A Minimum Ignition Circuit
Ground
16 AWG Wire, Black with Ring Connector
Electronic Overspeed Controller - 329650X
(1.0")
(1.8")
(4.9")
OPTIONAL 329093-XX CABLE (3 FT.) MUST BE ORDERED SEPARATE BY CUSTOMER
329323-110X MALE & FEMALE CONNECTOR CABLE (10 FT.) SUPPLIED WITH SPEED LIMITER
FROM TRANSMISSION (HIGH PRESSURE) - TO - VALVE (INLET)
FROM VALVE (EXHAUST) - TO - P.T.O. (DUMP PORT-B)
FROM VALVE OUTLET PORT-A TO P.T.O.
NOTES:
1) For Installation Parts Refer to Kits: 329029-12X & -24X = Installation Kit 329049X = Special Fitting Kit
2) Direction of Oil Flow
3) Strip Wire Ends 0.25" Prior to Installing Connector

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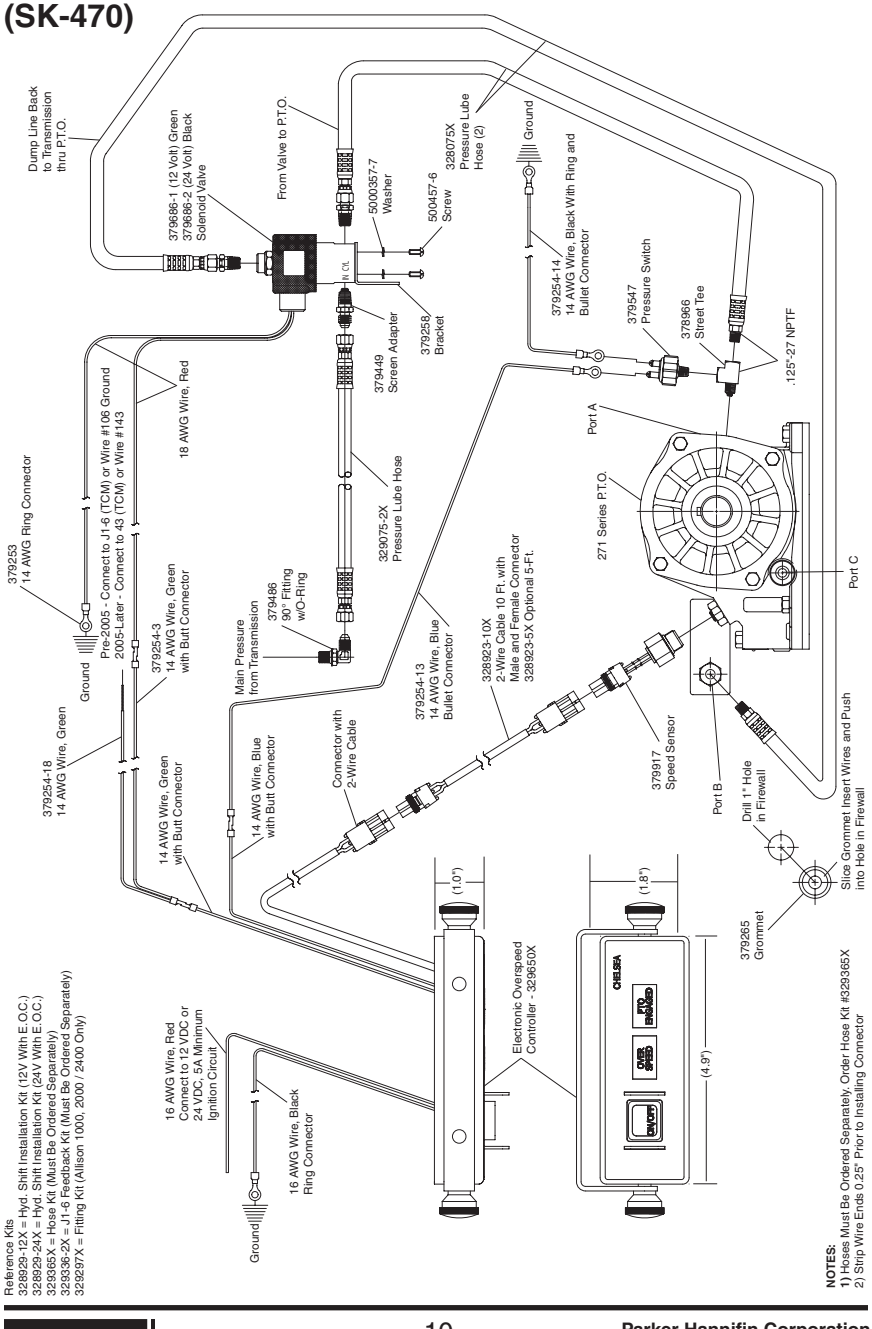
Electronic Over Speed Control (E.O.C.) Installation Sketch for 270 and 271 Series (Allison 1000, 2000/2400) (SK-470)


Dump Line Back to Transmission thru P.T.O.
379686-1 (12 Volt) Green
379686-2 (24 Volt) Black
Solenoid Valve
From Valve to P.T.O.
5000357-7 Washer
500457-6 Screw
328075X Pressure Lube Hose (2)
Ground
379254-14 14 AWG Wire, Black With Ring and Bullet Connector
379547 Pressure Switch
378966 Street Tee
.125"-27 NPTF
379258 Bracket
379449 Screen Adapter
329075-2X Pressure Lube Hose
18 AWG Wire, Red
379253 14 AWG Ring Connector
Ground
Pre-2005 - Connect to J1-6 (TCM) or Wire #106 Ground
2005-Later - Connect to 43 (TCM) or Wire #143
379254-3 14 AWG Wire, Green with Butt Connector
379254-18 14 AWG Wire, Green
Main Pressure from Transmission
379486 90° Fitting w/O-Ring
379254-13 14 AWG Wire, Blue Bullet Connector
328923-10X 2-Wire Cable 10 Ft. with Male and Female Connector
328923-5X Optional 5-Ft.
Port A
271 Series P.T.O.
Port C
Port B
379917 Speed Sensor
Drill 1" Hole in Firewall
Slice Grommet Insert Wires and Push into Hole in Firewall
379265 Grommet
14 AWG Wire, Green with Butt Connector
14 AWG Wire, Blue with Butt Connector
Connector with 2-Wire Cable
(1.0")
(1.8")
(4.9")
Electronic Overspeed Controller - 329650X
16 AWG Wire, Red Connect to 12 VDC or 24 VDC, 5A Minimum Ignition Circuit
16 AWG Wire, Black Ring Connector
Ground
Reference Kits
328929-12X = Hyd. Shift Installation Kit (12V With E.O.C.)
328929-24X = Hyd. Shift Installation Kit (24V With E.O.C.)
329365X = Hose Kit (Must Be Ordered Separately)
329336-2X = J1-6 Feedback Kit (Must Be Ordered Separately)
329297X = Fitting Kit (Allison 1000, 2000 / 2400 Only)
NOTES:
1) Hoses Must Be Ordered Separately, Order Hose Kit #329365X
2) Strip Wire Ends 0.25" Prior to Installing Connector

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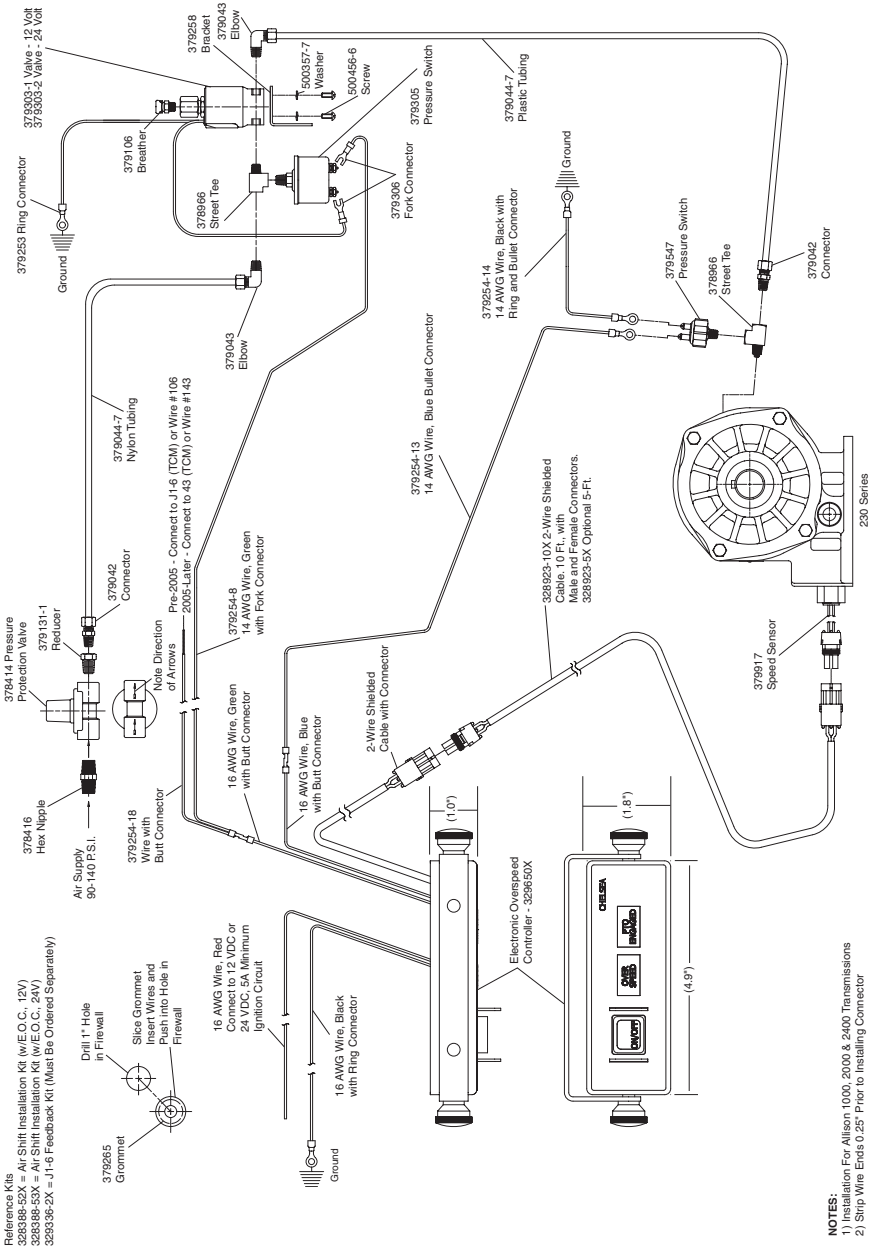
Electronic Over Speed Control (E.O.C.) Installation Sketch for 230 and 231 12 and 24 Volt (Allison 1000, 2000/2400) (SK-471)


379303-1 Valve - 12 Volt
379303-2 Valve - 24 Volt
379258 Bracket
379043 Elbow
500357-7 Washer
500456-6 Screw
379305 Pressure Switch
379044-7 Plastic Tubing
379106 Breather
379253 Ring Connector
Ground
378966 Street Tee
379306 Fork Connector
379254-14 14 AWG Wire, Black with Ring and Bullet Connector
379547 Pressure Switch
379042 Connector
379043 Elbow
379044-7 Nylon Tubing
Pre-2005 - Connect to J1-6 (TCM) or Wire #106
2005-Later - Connect to 43 (TCM) or Wire #143
379254-13 14 AWG Wire, Blue Bullet Connector
328923-10X 2-Wire Shielded Cable, 10 Ft., with Male and Female Connectors. 328923-5X Optional 5-Ft.
230 Series
378414 Pressure Protection Valve
379131-1 Reducer
Note Direction of Arrows
379254-8 14 AWG Wire, Green with Fork Connector
16 AWG Wire, Green with Butt Connector
16 AWG Wire, Blue with Butt Connector
2-Wire Shielded Cable with Connector
379917 Speed Sensor
378416 Hex Nipple
Air Supply 90-140 P.S.I.
379254-18 Wire with Butt Connector
(1.0")
(1.8")
(4.9")
Electronic Overspeed Controller - 329650X
CHELSEA
Drill 1" Hole in Firewall
Slice Grommet Insert Wires and Push into Hole in Firewall
379265 Grommet
16 AWG Wire, Red Connect to 12 VDC or 24 VDC, 5A Minimum Ignition Circuit
16 AWG Wire, Black with Ring Connector
Ground
Reference Kits
328388-52X = Air Shift Installation Kit (w/E.O.C., 12V)
328388-53X = Air Shift Installation Kit (w/E.O.C., 24V)
329336-2X = J1-6 Feedback Kit (Must Be Ordered Separately)
NOTES:
1) Installation For Allison 1000, 2000 & 2400 Transmissions
2) Strip Wire Ends 0.25" Prior to Installing Connector

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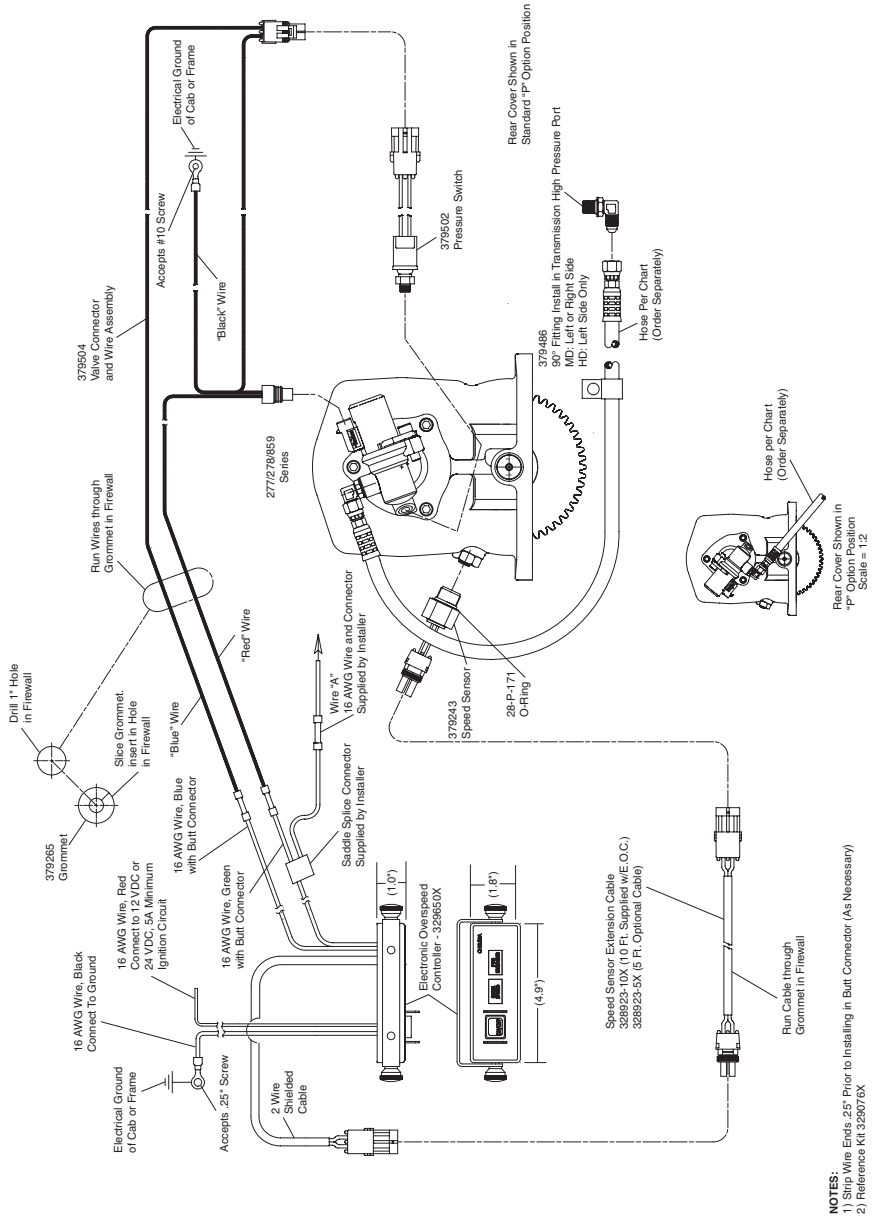
Electronic Over Speed Control (E.O.C.) Installation Sketch for 277, 278 & 859 Series for Allison (SK-472)



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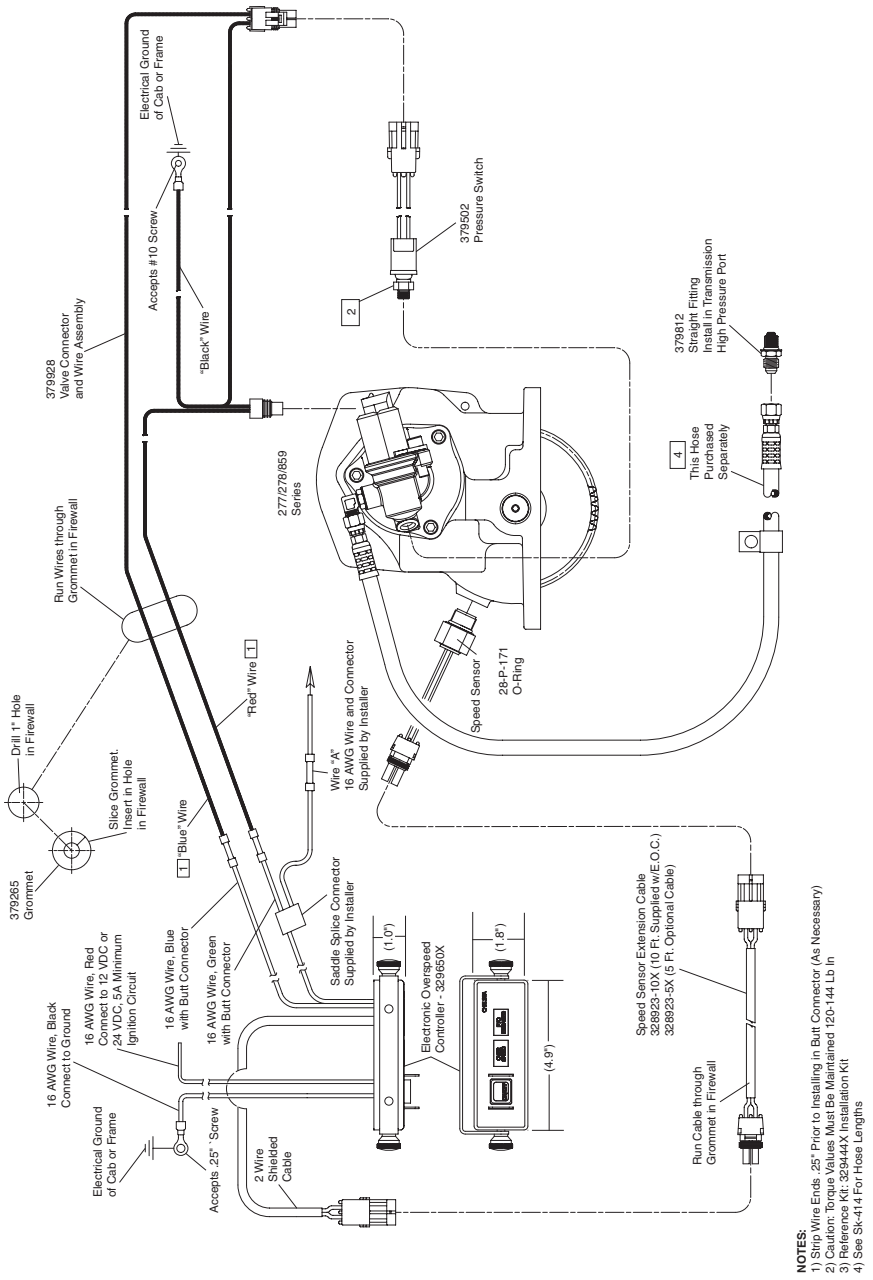
Electronic Over Speed Control (E.O.C.) Installation Sketch for 277, 278 and 859 Series for Caterpillar (SK-473)


Electrical Ground of Cab or Frame
Accepts #10 Screw
"Black" Wire
379928 Valve Connector and Wire Assembly
379502 Pressure Switch
2
379812 Straight Fitting Install in Transmission High Pressure Port
4
This Hose Purchased Separately
277/278/859 Series
Run Wires through Grommet in Firewall
Drill 1" Hole in Firewall
379265 Grommet
Slice Grommet. Insert in Hole in Firewall
"Red" Wire 1
"Blue" Wire 1
Speed Sensor
28-P-171 O-Ring
Wire "A" 16 AWG Wire and Connector Supplied by Installer
Saddle Splice Connector Supplied by Installer
16 AWG Wire, Blue with Butt Connector
16 AWG Wire, Red Connect to 12 VDC or 24 VDC, 5A Minimum Ignition Circuit
16 AWG Wire, Green with Butt Connector
16 AWG Wire, Black Connect to Ground
Electrical Ground of Cab or Frame
Accepts .25" Screw
2 Wire Shielded Cable
(1.0")
(1.8")
(4.9")
Electronic Overspeed Controller - 329650X
Speed Sensor Extension Cable 328923-10X (10 Ft. Supplied w/E.O.C.) 328923-5X (5 Ft. Optional Cable)
Run Cable through Grommet in Firewall
NOTES:
1) Strip Wire Ends .25" Prior to Installing in Butt Connector (As Necessary)
2) Caution: Torque Values Must Be Maintained 120-144 Lb In
3) Reference Kit: 329444X Installation Kit
4) See Sk-414 For Hose Lengths

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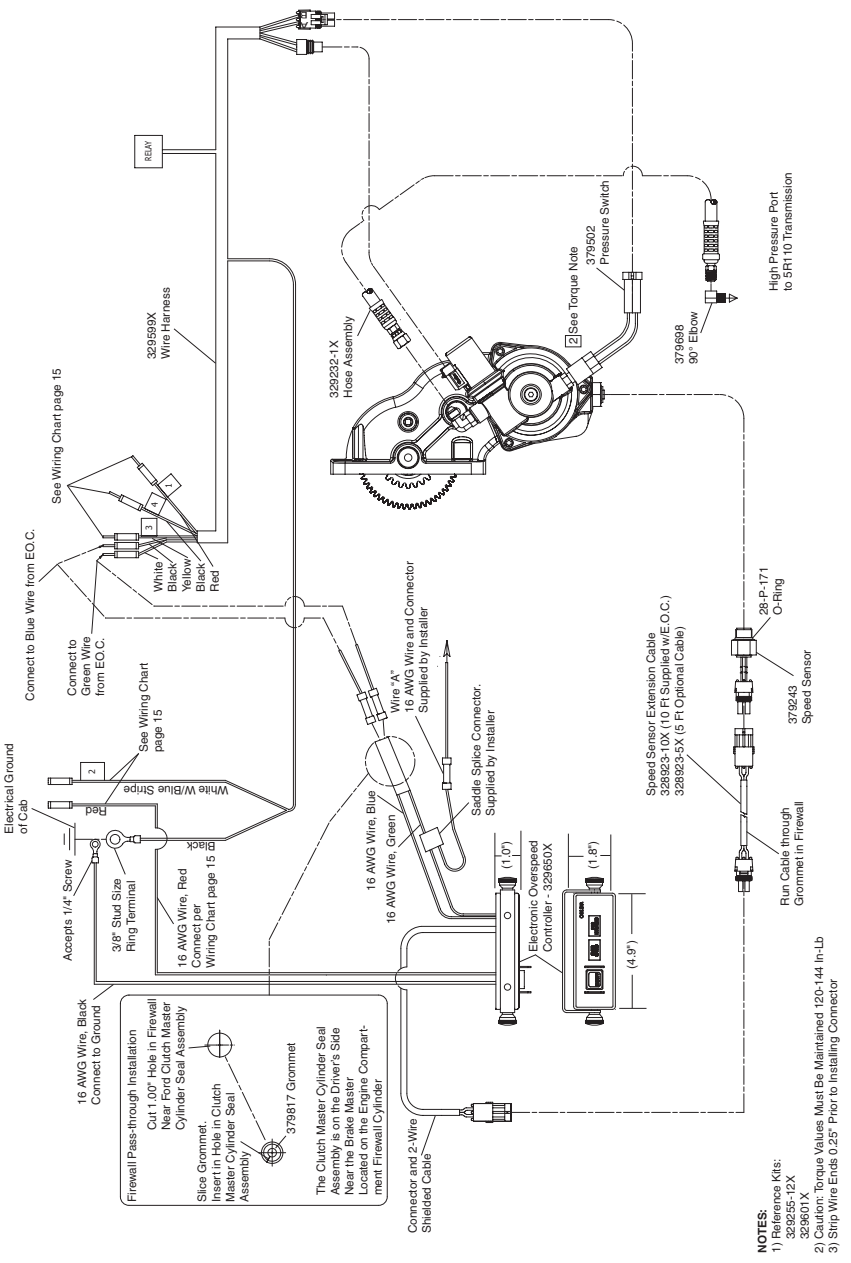
Electronic Over Speed Control (E.O.C.) Installation Sketch for 247 Series 12 and 24 Volt (SK-474)



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247 Series Wiring Chart with E.O.C.

Chelsea Wire	2005-2007 Super Duty w/6.0L Diesel	2005-2007 Super Duty w/6.8L Gas	2008-2010 Super Duty w/6.4L Diesel	2008-2010 Super Duty w/6.8L Gas	2005-2009 LCF w/4.5L Diesel	2011 Super Duty w/6.8L Gas
1	Not Used	Ford Circuit #2246 Orange w/Yellow Stripe	Not Used	Ford Circuit #CE914 Green	Not Used	Ford Circuit #CE914 Green
2	Not Used	Ford Circuit #294 White w/Lt. Blue Stripe	Not Used	Ford Circuit #CBP44 Purple	Not Used	Ford Circuit #CDC64 Yellow w/Orange Stripe
3	Not Used	Ford Circuit #2243 Orange w/White Stripe	Not Used	Ford Circuit #CE924 Blue w/Green Stripe	Not Used	Ford Circuit #CE924 Blue w/Green Stripe
4	Ground	Ford Circuit #2244 Orange w/Lt. Blue Stripe	Ground	Ford Circuit #CE326 Blue w/White Stripe	Ground	Ford Circuit #CE326 Blue w/White Stripe
E.O.C. Box Lt. Blue w/Yellow Stripe	Ford Circuit #2242 Orange	Ford Circuit #2242 Orange	Ford Circuit #CE912 Yellow w/Green Stripe	Ford Circuit #CE912 Yellow w/Green Stripe	Ford/International Circuit #2335 Purple w/Lt. Green Stripe	Ford Circuit #CE912 Yellow w/Green Stripe
E.O.C. Box Red	Ford Circuit #294 White w/Lt. Blue Stripe	Ford Circuit #294 White w/Lt. Blue Stripe	Ford Circuit #CBP44 Purple	Ford Circuit #CBP44 Purple	Ford/International Circuit #1043 Dark Green w/Yellow Stripe	Ford Circuit #CDC64 Yellow w/Orange Stripe

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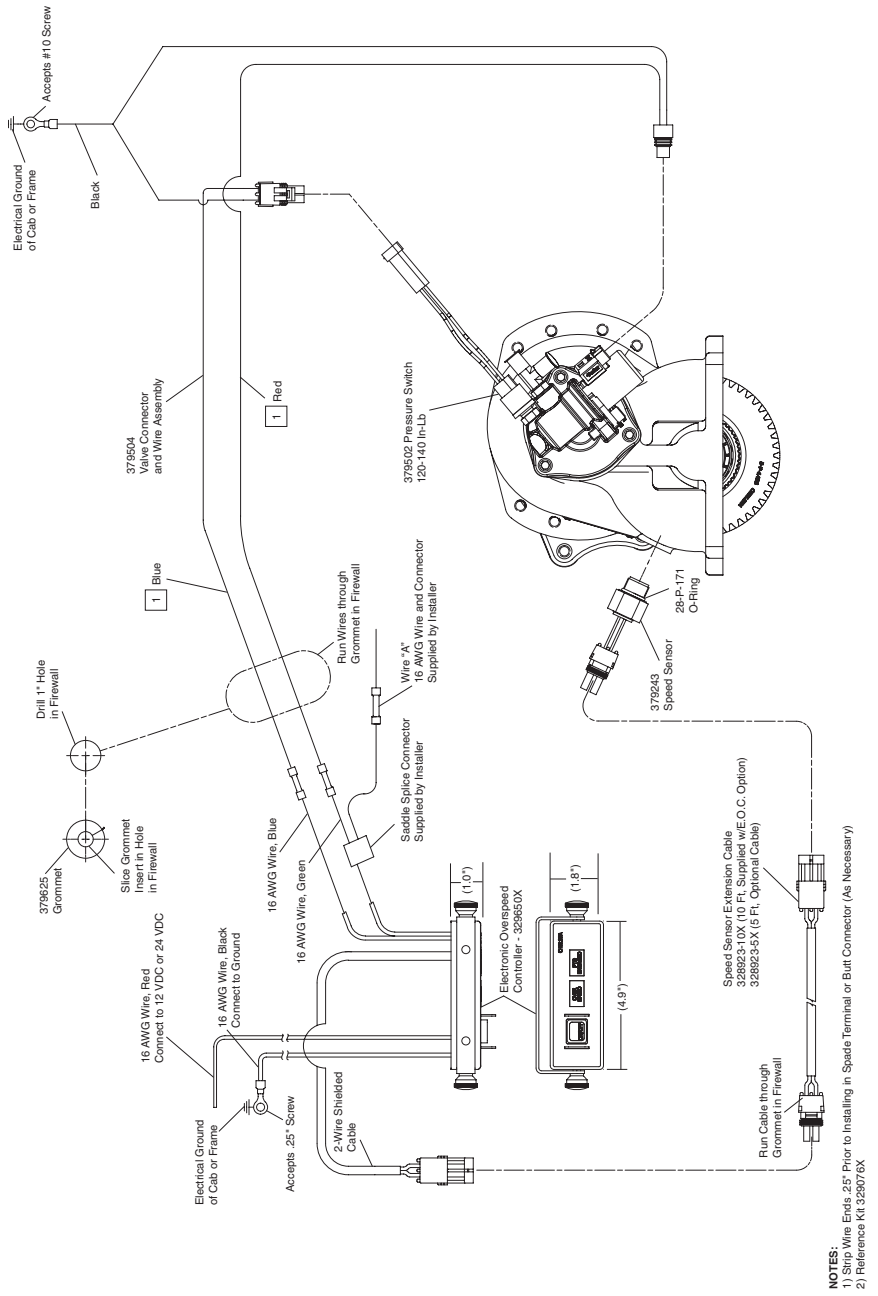
Electronic Over Speed Control (E.O.C.) Installation Sketch for 890 Series (SK-475)


Accepts #10 Screw
Electrical Ground of Cab or Frame
Black
379504 Valve Connector and Wire Assembly
1 Red
379502 Pressure Switch 120-140 In-Lb
1 Blue
Run Wires through Grommet in Firewall
Wire "A" 16 AWG Wire and Connector Supplied by Installer
28-P-171 O-Ring
379243 Speed Sensor
Drill 1" Hole in Firewall
379625 Grommet
Slice Grommet Insert in Hole in Firewall
16 AWG Wire, Blue
16 AWG Wire, Green
Saddle Splice Connector Supplied by Installer
(1.0")
(1.8")
(4.9")
Electronic Overspeed Controller - 329650X
Speed Sensor Extension Cable 328923-10X (10 Ft, Supplied w/E.O.C. Option) 328923-5X (5 Ft, Optional Cable)
16 AWG Wire, Red Connect to 12 VDC or 24 VDC
16 AWG Wire, Black Connect to Ground
Electrical Ground of Cab or Frame
Accepts .25" Screw
2-Wire Shielded Cable
Run Cable through Grommet in Firewall
NOTES:
1) Strip Wire Ends .25" Prior to Installing in Spade Terminal or Butt Connector (As Necessary)
2) Reference Kit 329076X

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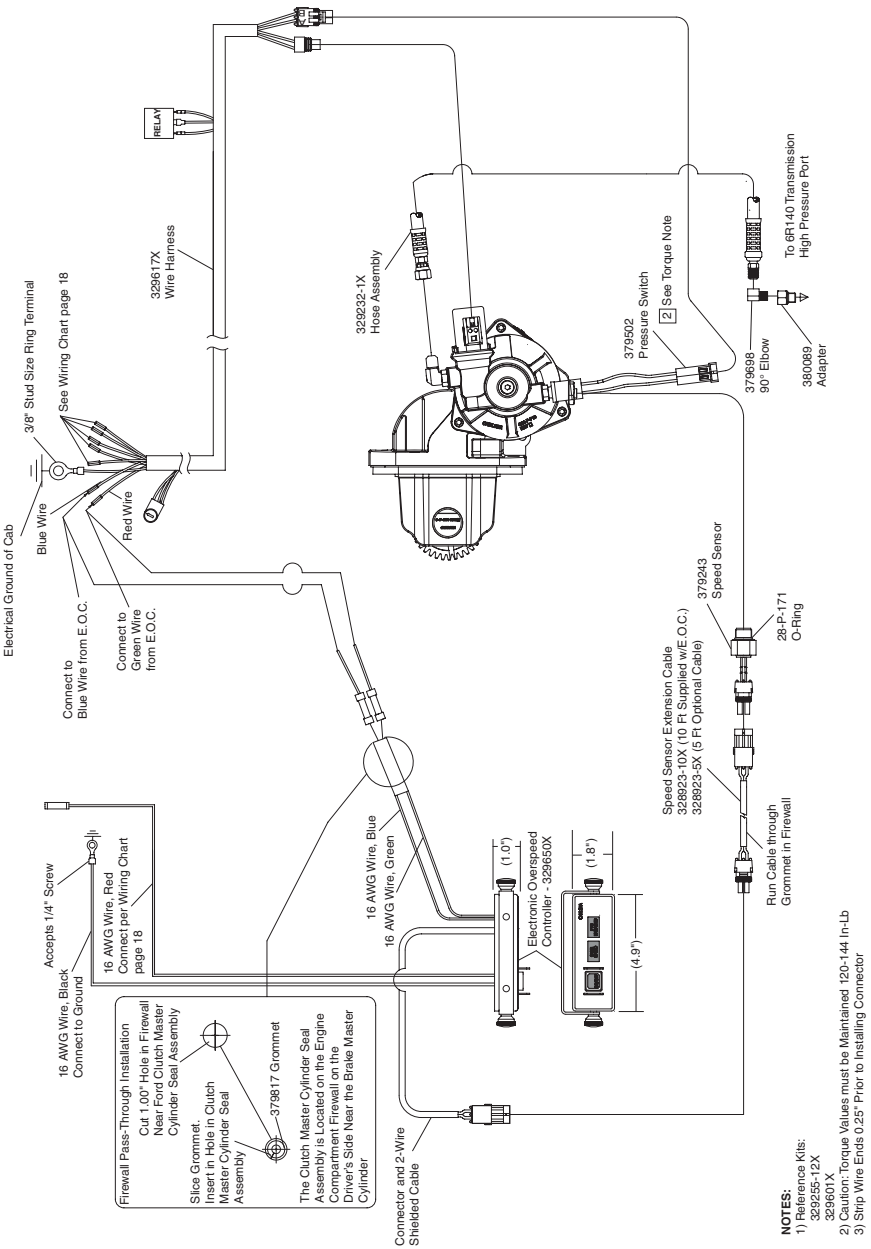
Electronic Over Speed Control (E.O.C.) Installation Sketch for 248 Series (SK-489)



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248 Series Wiring Chart with E.O.C. 2011 Super Duty w/6.7L Diesel

Chelsea Wire	Stationary Mode	Mobile Mode
White Wire	Ford PTOREF #LE434 White w/Brown Stripe	Ford PTOREF #LE434 White w/Brown Stripe
Gray Wire	Ford PTORTN #RE327 ©Gray w/Violet Stripe	Ford PTORTN #RE327 Gray w/Violet Stripe
Green Wire	Ford PTO_RPM #CE914 Green	Ford PTO_RPM #CE914 Green
Blue w/White Stripe	Ford PTO_RLY #CE 326 Blue w/White Stripe	Ford PTO_RLY #CE 326 Blue w/White Stripe
Black w/Ring Terminal	Ford Chassis Ground in Dash	Ford Chassis Ground in Dash
Yellow Wire	Ford PTORS1 #CE912 Yellow w/Green Stripe	Ford PTORS2 #CE933 (1) Blue w/Orange Stripe
Blue Wire	Chelsea E.O.C. Blue Wire	Chelsea E.O.C. Blue Wire
Red Wire	Chelsea E.O.C. Green Wire	Chelsea E.O.C. Green Wire

NOTE: (1) Early MY2011 Product Units may come with two Blunt Cut Blue w/Gray Stripe wires. One wire will be for P.T.O. Function (PTORS2) the other will be a Customer Wire for "Park Only Output" (TRO-P). Refer to Ford Body Builders web site for more on this subject.

E.O.C. Wires

Chelsea E.O.C. Wire	Stationary Mode	Mobile Mode
Red Wire	Ford 12V #CDC64 Yellow w/Orange Stripe	Ford 12V #CDC64 Yellow w/Orange Stripe
Black w/Ring Terminal	Ford Chassis Ground in Dash	Ford Chassis Ground in Dash

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Control Adjustment Instructions

Selecting the Overspeed R.P.M.:

This is usually based on safety, noise control or fuel economy considerations. The high limit set point should be set no greater than the maximum speed allowed by the manufacturer of the driven equipment, and the engine, BUT IN NO CASE GREATER THAN 3000 R.P.M.

Selecting the Reset R.P.M.:

The control is set to provide a reset, after an over-speed disengagement. The automatic reset should be set above the engine fast idle speed, BUT NO GREATER THAN 1000 R.P.M.

Safety Precautions and Preparations:

The control settings are to be made with the engine running – provide adequate ventilation and exhaust elimination or make the adjustments outdoors. Put the vehicle transmission in neutral, set the vehicle brakes and chock the wheels.

Disengage the driven equipment.

Connect a tachometer to the engine, if there is not one in the vehicle.

Description of Re-Engagement Modes

1. Manual Engagement Mode- In this mode the user must manually depress the On/Off button to re-engage the P.T.O. after an Overspeed condition.

NOTE: The unit is preset from the factory in this mode

2. Auto Engagement Mode- In this mode the unit automatically re-engages the P.T.O. after an Overspeed condition and the lower set point has been reached.

WARNING: When the Parker Chelsea Electronic Overspeed Controller is set up in Auto Re-engagement Mode, the P.T.O. will automatically engage when the engine RPM reaches the lower preset point thus causing the driven equipment to become operable. The vehicle or equipment operator must therefore make certain that other persons and property are not in a position to be crushed, impacted, caused to fall or otherwise injured when re-engagement occurs.

Control Adjustment Instructions (Continued)

Setting Procedure - Re-Engagement Modes

1. Turn on the unit to set the re-engage modes.

2. By depressing the Brightness ("B") and High Limit Set ("H") buttons simultaneously the unit's mode of re-engagement is changed from "Manual Engagement Mode" to "Auto Engagement Mode". Both the red and yellow LED's flash once to notify the installer the unit is in "Auto Engagement Mode". In "Auto Engagement Mode" the P.T.O. re-engages automatically once the engine's R.P.M. reach the lower set point.

3. Depressing the "B" and "H" buttons simultaneously again switches the unit from "Automatic Engagement Mode" back to "Manual Engagement Mode". Both the red and yellow LED's flash twice to notify the installer the unit is in "Manual Engagment Mode".

Setting Procedure - Speed Limits

1. Start the engine and allow it to idle. The "On/Off" button will be illuminated white to indicate the unit is turned Off. The P.T.O. should be disengaged.

2. Turn the system On by depressing the "On/Off" button. You must hold the button down for 0.5 seconds for the unit to turn On. When turned On, the "On/Off" button will turn from white to red, the P.T.O. will engage and the red "P.T.O. Engaged" will illuminate.

3. Ramp up the vehicle's R.P.M. to the R.P.M. the user desires the P.T.O. to automatically disengage. Depress the "H" (High Limit) button on the bottom of the unit using a small tool or pencil point. The yellow "Over Speed" will illuminate, the P.T.O. will disengage, the red "P.T.O. Engaged" will turn off.

4. Slowly let the vehicle's R.P.M. fall to the lower R.P.M. setting where the user desires the P.T.O. to be able to be re-engaged. Depress the "L" (Low Limit) button on the bottom of the unit using a small tool or pencil point. The yellow "Over Speed" will turn off and the "On/Off" button will be red and flashing. Further lower the R.P.M. slightly. The "On/Off" button flashing

Control Adjustment Instructions (Continued)

red indicates that the unit is ready to re-engage the P.T.O.

5. Depress the flashing "On/Off" button to re-engage the P.T.O. The P.T.O. will engage and the red "P.T.O. Engaged" will illuminate.

6. If the unit is in the "AUTOMATIC Engagement Mode" the P.T.O. will be engaged automatically when the "L" (Low Limit) Button is depressed.

7. These settings are permanently held in memory until they are changed or the user resets the unit to the "Default" mode.

8. To reset the unit to the "Default" mode the E.O.C. must be turned Off. Depress both the "L" and "H" buttons simultaneously. All LED's will flash 3 times to acknowledge the unit has been reset to the default mode. In the "Default" mode, only the "On/Off" button is active and the over speed feature is inactive. The unit may be used in this mode if desired.

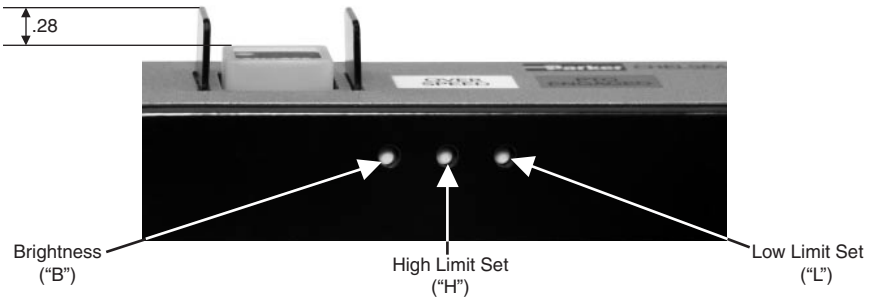
Setting the LED Brightness

1. The LED brightness can be adjusted to (4) different intensities. Locate the "B" button on the bottom of the unit.

2. Continuously depress the "B" button until the desired brightness is obtained.

Final Installation of the Control:

After the overspeed and the reset set points are correctly set, complete the installation of the control, under the dash or on the engine housing, utilizing the supplied bracket and hardware. Be sure the E.O.C. unit is located within easy reach of the operator and is clearly visible.



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Before Starting the Engine

With the vehicle turned OFF, all lights in the E.O.C. unit should be OFF.

Engaging the Power Take-Off

1. When the vehicle ignition is on and the E.O.C. unit is Off, the "On/Off" button is illuminated white.

2. To turn On the E.O.C. unit, depress the "On/Off" button. You must hold down the button for at least 0.5 seconds for the unit to activate. This helps prevent unintentional P.T.O. engagement. Upon activation the "On/Off" button will turn from white to red.

3. When the P.T.O. engages, the pressure switch will close and the red "P.T.O. Engaged" will illuminate.

4. Should the operating R.P.M. reach the Overspeed set point, the yellow "Over Speed" will illuminate, the P.T.O. will disengage and the red "P.T.O. Engaged" will turn off due to the lack of a signal from the P.T.O. pressure switch.

5. To re-engage the P.T.O. lower the vehicle R.P.M. to less than the lower set point.

a. When the lower R.P.M. set point is reached, the yellow "Over Speed" will turn off and the red backlight on the "On/Off" button will begin to flash if in the "MANUAL Engagement Mode". Depress the "On/Off" button for 0.5 second to re-engage the P.T.O.

b. Once depressed, the flashing red "On/Off" button returns to solid red, the P.T.O. re-engages and the red "P.T.O. Engaged" will illuminate due to the signal from the P.T.O. pressure switch.

c. If the unit is in the "Auto Engagement Mode" then the P.T.O. re-engages automatically when the lower rpm threshold is reached.

d. Once the P.T.O. is re-engaged, the "On/Off" button red backlight stops flashing, the P.T.O. solenoid is re-energized and the red "P.T.O. Engaged" LED should illuminate due to the signal from the P.T.O. pressure switch.

WARNING: When the Parker Chelsea Electronic Overspeed Controller is set up in Auto Re-engagement Mode, the P.T.O. will automatically engage when the engine RPM reaches the lower preset point thus causing the driven equipment to become operable. The vehicle or equipment operator must therefore make certain that other persons and property are not in a position to be crushed, impacted, caused to fall or otherwise injured when re-engagement occurs.

6. Should the user try to turn On the P.T.O. while the R.P.M. is above the lower set point, the yellow "Over Speed" will illuminate, the "On/Off" button will turn from white to flashing red but the P.T.O. will not engage.

7. Reduce the R.P.M. till it is below the lower set point, the yellow "Over Speed" will turn off and the "On/Off" button will continue to flash. Depress the "On/Off" button for 0.5 seconds to engage the P.T.O.

Setting the LED Brightness

1. The LED brightness can be adjusted to (4) different intensities. Locate the "B" button on the bottom of the unit.

2. Continuously depress the "B" button using a small tool or pencil point until the desired brightness is obtained.

Adjusting the Throttle Opening

The Chelsea Electronic Overspeed Control is not a governor, and changing load conditions will make it necessary to make corresponding changes in the throttle opening to maintain a uniform rate of working, without lugging or overspeeding the equipment.

Troubleshooting

Problem	Possible Causes	Remedy
P.T.O. will not engage	Blown fuse in back of unit	Replace fuse with 3 amp automotive stab fuse.
	Poor ground connections	Check all ground connections. Connect securely to chasis.
	P.T.O. Solenoid valve	Check wiring to solenoid valve. Replace solenoid valve.
	E.O.C. control	Check wiring to E.O.C.
P.T.O. will not engage but red light comes on	Shorted pressure switch	Check wiring to Pressure switch.
	Defective P.T.O.	Check for solenoid malfunction.
P.T.O. engages, but red light doesn't come on	Defective red LED	Replace E.O.C. unit.
	Open pressure switch	Check wiring to pressure switch. Check that ground is secure to chassis.
	Poor ground connection on pressure switch	Check that ground is secure to chassis.

NOTE: Unit should be checked periodically to make sure speed sensor is operating. Speed sensor is checked by going to overspeed condition. If yellow light does NOT come on in overspeed condition, speed sensor may not be operating or the E.O.C. unit may be in Default Mode. See "Setting Procedure". This could also indicate that control box is not operating either. Wiring harness should also be checked for breaks or disconnections.

Power Take-Off Maintenance

Due to the normal and sometime severe torsional vibrations that Power Take-Off units experience, operators should follow a set maintenance schedule for inspections. Failure to service loose bolts or Power Take-Off leaks could result in potential auxiliary Power-Take-Off or transmission damage.

Periodic P.T.O. MAINTENANCE is required by the owner/operator to ensure proper, safe and trouble free operation.

Daily: Check all air, hydraulic and working mechanisms before operating P.T.O. Perform maintenance as required.

Monthly: Inspect for possible leaks and tighten all air, hydraulic and mounting hardware, if necessary. Torque all bolts, nuts, etc. to Chelsea specifications. Ensure that splines are properly lubricated, if applicable. Perform maintenance as required.

With regards to the direct mounted pump splines, the P.T.O. requires the application of a specially formulated anti-fretting, high pressure, high temperature grease. The addition of the grease has been proven to reduce the effects of the torsional vibrations, which result in fretting corrosion on the P.T.O. internal splines as well as the pump external splines. Fretting corrosion appears as a "rusting and wearing" of the pump shaft splines. Severe duty applications, which require long P.T.O. running times and high torque may require more frequent regreasing. Applications such as Utility Trucks that run continuously and are lightly loaded also require frequent regreasing due to the sheer hours of running time. It is important to note that service intervals will vary for each and every application and is the responsibility of the end user of the product. Chelsea also recommends that you consult your pump owners manuals and technical services for their maintenance guidelines. Fretting corrosion is caused by many factors and without proper maintenance; the anti-fretting grease can only reduce its effects on components.

Chelsea offers the grease to our customers in two packages. The first is a 5/8 fluid ounce tube (379688), which is included with every applicable P.T.O., and the second is a 14-ounce grease cartridge (379831). Chelsea also offers greaseable shafts for most all output designators.

Warranty: Failure to comply entirely with the provisions set forth in the appropriate Owner's Manual will result in voiding of ALL Warranty consideration.

Notes

Offer of Sale

The items described in this document and other documents or descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors are hereby offered for sale at prices to be established by Parker Hannifin Corporation, its subsidiaries and its authorized distributors. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any such items, when communicated to Parker Hannifin Corporation, its subsidiary or an authorized distributor ("Seller") verbally or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions of Sale: All descriptions, quotations, proposals, offers, acknowledgments, acceptances and sales of Seller's products are subject to and shall be governed exclusively by the terms and conditions stated herein. Buyer's acceptance of any offer to sell is limited to these terms and conditions. Any terms or conditions in addition to, or inconsistent with those stated herein, proposed by Buyer in any acceptance of an offer by Seller, are hereby objected to. No such additional, different or inconsistent terms and conditions shall become part of the contract between Buyer and Seller unless expressly accepted in writing by Seller. Seller's acceptance of any offer to purchase by Buyer is expressly conditional upon Buyer's assent to all the terms and conditions stated herein, including any terms in addition to, or inconsistent with those contained in Buyer's offer, Acceptance of Seller's products shall in all events constitute such assent.

2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that certain Products, namely PTOs, SEMs, and Wet Line Kits sold hereunder shall be free from defects in material or workmanship for a period of twenty four months from the date of delivery to Buyer. Seller warrants that certain Products namely Pumps, and Hydraulic Accessories shall be free from defects in material or workmanship for a period of eighteen months from the date of delivery to the Buyer. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. Limitation Of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property, Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain there/to. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

10/09-P

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